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DOCKET NO.: E00295.70136.US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Fred Oliveira et al.
Serial No: 09/474,607
Confirmation. No.: 2467
Filed: December 29, 1999
For: METHOD AND APPARATUS FOR USING MULTIPLE PATHS
FOR PROCESSING OUT OF BAND COMMANDS

Examiner: Melvin H. Pollack
Art Unit: 2152

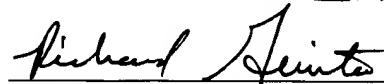
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Richard F. Giunta, Reg. No. : 36,149

Commissioner For Patents
Washington, D.C. 20231

Sir:

Transmitted herewith are the following documents:

Response to Office Action
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If the enclosed papers are considered incomplete, the Mail Room and/or the Application Branch is respectfully requested to contact the undersigned at (617) 720-3500, Boston, Massachusetts.

A check is not enclosed. If a fee is required, the Commissioner is hereby authorized to charge Deposit Account No. 23/2825. A duplicate of this sheet is enclosed.

Respectfully submitted,
Fred Oliveira et al., Applicant

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Docket No. E00295.70136.US

Date: 11/5/02

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ATTORNEY'S DOCKET NO: E00295.70136.US

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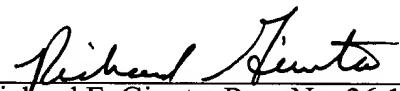
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Richard F. Giunta, Reg. No. 36,149

Commissioner for Patents
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION

Sir:

In response to the Office Action mailed August 20, 2002 (Paper No. 2), Applicants respectfully request reconsideration. To further the prosecution of the present application, each of the rejections set forth in the Office Action has been considered and is addressed below. The application is believed to be in condition for allowance.

Initially, Applicants' representatives thank Examiner Pollack for the courtesies extended in granting and conducting a telephone interview on September 18, 2002. The substance of the interview is summarized below. In brief, Applicants pointed out that the meaning ascribed to the claimed term "out of band command" in the Office Action is misplaced, and not in accordance with the meaning defined in the specification. While the Examiner was understandably unwilling to commit to withdrawing the rejection during the interview, he did request that Applicants' attorneys memorialize the argument in writing, and agreed that he would reconsider the rejection.

Claim Rejections Under 35 USC §102 and §103

All of Applicants' claims 1-22 (including independent claims 1, 8 and 15) were rejected under 35 USC §102(e) as being anticipated by Kikinis, and/or under §103 as being obvious over Kikinis in view of one or more secondary references. These rejections are respectfully traversed.

1. Overview of the Invention and Out of Band Commands

One aspect of the present invention relates to the use of out of band commands in multi-path computer systems. An example of a multi-path system is shown in Fig. 12 of Applicants' specification. In the multi-path system of Fig. 12, multiple paths P1-P4 are provided between a host computer 101 and a storage system. Multi-path systems can be advantageous, in that multiple communications can be processed simultaneously between the host computer and the storage system. (page 30, lines 11-12). In addition, in some multi-path systems, load balancing techniques can be employed to select appropriate paths for performing communications to increase system performance. (page 30, lines 29-31).

As mentioned above, one aspect of the present invention specifically relates to processing out of band control commands in a multi-path system. As described in Applicants' specification from page 32, line 22 – page 33, line 6, an out of band control command is distinguishable from in-band communications which pass through the normal read/write path of the system. Out of band commands bypass one or more layers in the normal read/write data path, and can be associated with control functions or the reading and writing of data outside of the normal read/write path. As made clear in the specification:

as used herein, the term "out of band control command" refers to any control command outside of the normal read/write path of the system, which can include commands that implement control functions, as well as those that perform read or write operations outside of the normal read/write path.

Out of band control commands are path-specific operations, and typically will identify a particular one of the multiple paths P1-P4 over which the communication is to take place. (page 27, lines 10-14). Conventional multi-path systems can process out of band control commands only over the particular target path specified. (page 28, lines 22-25). As a result, the benefits of employing multiple paths are not realized in computer systems that employ conventional techniques for processing out of band control commands.

In accordance with one embodiment of the present invention, a method and apparatus is provided that enables a path to be selected for transmitting an out of band control command, using a selection criteria that enables the selected path to be other than the target path identified by the out of band control command.

2. Kikinis Does Not Relate At All to the Processing of Out of Band Commands

Kikinis is directed to a system for enhancing data delivery over the Internet or an intranet. (See e.g., col. 1, lines 5-10). Kikinis states that some conventional systems developed for Internet communication employed land-based links which are advantageous in that they are secure, but are narrow-band and limited in their data transmission capacity. (see e.g., col. 1, lines 14-18 and col. 2, lines 37-45). Kikinis further states that other Internet communication systems utilized satellite technology that has higher bandwidth capability, but can suffer from being less secure than a land-based system. (see e.g., col. 2, lines 21-32). The Kikinis invention is directed to an Internet delivery service that employs multiple communication paths, including a land-based communication path and a satellite communication path, to take advantage of the best features of both types of systems. (col. 3, lines 37-42).

Kikinis is completely silent with respect to the teaching of any out of band control commands. The Office Action asserts “The definition of an out of band command is a command that runs over a different wire.” (Office Action, page 3). Thus, the Office Action points to the teaching in Kikinis wherein a request for information received via a land-based connection can be sent back to the user over either a satellite connection or a land connection, and asserts that this teaches the processing of an out of band control command. As should be appreciated from the foregoing, this interpretation of the claimed term “out of band control command” is entirely unsupported in Kikinis. Furthermore, Applicants’ specification specifically defines an out of band control command in a manner that is inconsistent with the assertion in the Office Action, such that the interpretation adopted in the Office Action is improper:

as used herein, the term “out of band control command” refers to any control command outside of the normal read/write path of the system, which can include commands that implement control functions, as well as those that perform read or write operations outside of the normal read/write path.

While the Examiner is entitled to give claims their broadest *reasonable* interpretation, they must be interpreted in light of the specification and cannot be interpreted in a manner inconsistent with a definition provided therein, as Applicants are entitled to be their own lexicographer. (MPEP §2111 and 2111.01).

3. Applicants' Claims Distinguish Over the Prior Art of Record

A. Claims 1-7

Independent claim 1 is directed to a method of processing an out of band control command executed by a host computer in a multi-path system. The method comprises a step of selecting a path for transmitting an out of band control command, wherein the selected path is selected from among multiple paths based upon a selection criteria that enables the selected path to be other than the target path identified by the out of band control command.

As should be appreciated from the foregoing, Kikinis is completely silent with respect to teaching anything about the processing of an out of band control command (when that term is properly interpreted in view of Applicants' specification), let alone selecting a path for transmitting such a command using a selection criteria that enables the selected path to be other than the target path identified in the command. Thus, it is respectfully asserted that the rejection of claim 1 over Kikinis is improper, and should be withdrawn.

Claims 2-7 depend from claim 1 and are patentable for at least the same reasons. In this respect, to the extent that some of the dependent claims are rejected under §103 over Kikinis in view of Billings and/or Doner, those secondary references do not cure the deficiency of Kikinis in failing to teach the processing of an out of band control command.

B. Claims 8-14

Claim 8 is directed to a computer readable medium encoded with a program that, when executed, performs a method substantially similar to claim 1. Therefore, for the reasons discussed above in connection with claim 1, it is respectfully asserted that claim 8 patentably distinguishes over the prior art of record, such that the rejection of claim 8 (as well as claims 9-14 depending therefrom) should be withdrawn.

C. Claims 15-22

Independent claim 15 is directed to a host computer for use in a multi-path system. The host computer comprises at least one processor to execute an out of band control command, and at